EARTHECHO INTERNATIONAL

Host a Tree Planting In Your Community

HOW TO GUIDE

Next Generation Science Standards

ESS3.C Human Impacts on Earth Systems

Human activities have significantly altered the biosphere, sometimes damaging or destroying natural habitats and causing the extinction of other species. But changes to Earth's environments can have different impacts (negative and positive) for different living things.

MS ESS3-3 Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

ETS1.A: Defining and Delimiting Engineering Problems

The more precisely a design task's criteria and constraints can be defined, the more likely it is that the designed solution will be successful. Specification of constraints includes consideration of scientific principles and other relevant knowledge that are likely to limit possible solutions.

MS-ETS1-1 Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

Common Core English Language Arts Standards

RI.5.1 Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text

RI.6.1;RI.7.1;RI.8.1 Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text

RI.5.4 Determine the meaning of general academic and domain-specific words and phrases

RI.6.4;RI.7.4;RI.8.4 Determine the meaning of words and phrases as they are used in a text.

RI5.7 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.

RI.6.7 Integrate information presented in different media or formats (for example visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.

RI5.9 Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably.

W5.7 Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic

W6.7 Conduct short research projects to answer a question, drawing on several sources and refocusing the inquiry when appropriate

W7.7 Conduct short research projects to answer a question, drawing on several sources and generating additional related, focused questions for further research and investigation

W8.7 Conduct short research projects to answer a question, (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration

W5.9; W6.9; W7.9; W8.9 Draw evidence from informational texts to support analysis, reflection and research

SL5.2 Summarize a written text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.

SL6.2 Interpret information presented in diverse media and formats, (eg. visually, quantitatively and orally) and explain how it contributes to a topic, a text, or issue under study

L5.1; L6.1; L7.1; L8.1 Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

L5.2; L6.2; L7.2; L8.2 Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing

L5.3; L6.3; L7.3; L8.3 Use knowledge of language and its conventions when writing, speaking, reading, or listening

L5.6; L6.6; L7.6; L8.6 Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases

How to Host a Tree Planting

Project Summary

While learning about ocean acidification, students will investigate local issues related to carbon emissions. Through their investigation, students will identify local issues and plan for the planting of native tree species to aid in mitigating carbon emissions in their community. .

Driving Question

How can native trees help to mitigate environmental problems in my own community?

Investigate

Before jumping into action, students must first understand the necessity of their action and the scientific concepts behind the issues. During the investigation stage, you will lead students through brainstorming activities, video investigations, and text and media investigations.

WATCH

EarthEcho Expeditions: Shell Shocked: Not Just Chemistry

Ocean acidification is about more than just water chemistry. Climb aboard with Philippe Cousteau as he talks with students, scientists, and fishermen to explore how the people of Washington's Olympic Coast are responding to changing marine ecosystems.

Youth in Action: Plant for the Planet

Leadership in public policy is vital to solving global challenges. Aji, Adonis, and Gabe from the Seattle chapter of Plant for the Planet explain how this team uses the power of music as well as the law to advocate for a sustainable planet.

READ

What is Ocean Acidification? from the PMEL Carbon Program

This article, most appropriate for older students (7th grade+), succinctly discusses Ocean Acidification and its effects on marine life.

Carbon & Tree Facts from the Arbor Environmental Alliance

This quick fact sheet describes the relationship between trees and carbon dioxide. Be sure that students pay special attention to how much carbon dioxide an average tree removes the atmosphere every year (48 lbs).

How Planting a Tree Can Reduce Your Carbon Footprint

A short blog from One Tree Planted, outlining benefits of planting trees.

DO: Mini-Lab

Carbon Footprint Calculator

Before discussing how much carbon trees are able to offset, students must be able to conceptualize how their daily actions impact carbon emissions. There are many, many carbon footprint calculators on the Web with varying degrees of specificity. The two below are perfect for students because they do not require the input of annual electricity bills. The first is a short, simple calculator that could be used in class, while the second is more involved and could be used in school or as a homework assignment:

- The Ocean Foundation's Sea Grass Grow "Blue" Carbon Footprint Calculator
- International Student Carbon Footprint Challenge (Stanford)

After students have established a number (in tons) for the amount of carbon dioxide emissions each person produces per year, they may calculate how many trees are needed to offset their yearly carbon emissions. Older students should be able to come up with this formula on their own. For younger students, do the math together as a group, using an average number for yearly carbon emissions:

1. Convert your CO2 total to pounds. The Ocean Foundation's calculator provides results in tons, while the Stanford calculator uses kilograms.
   1kg = 2.2lbs ; 1 ton = 2000 lbs
2. Divide your total CO2 emissions in pounds, by 48lbs (the average amount of CO2 one tree can absorb per year).

Now that the students have learned a bit about ocean acidification and their own carbon footprints, brainstorm as a class various ways to curb or mitigate your carbon emissions. Take time to allow students to brainstorm and discuss many different solutions to this problem. In reality, curbing and mitigating our carbon emissions will take many different solutions, but the remainder of this guide will focus on tree planting as one solution.

PROBLEM STATEMENT

Once students have brainstormed, direct them toward a tree planting solution and work together to craft a problem statement. The problem statement will help to guide students as they take action throughout the rest of the project.

Your problem statement should answer three questions:
- What is the problem or need?
- Who has the problem or need?
- Why is it important to solve?

Problem statements should be written in the following format: **Who** need(s) **what** because **why**.
Ex. *Washington, DC* needs *a tree planting* because *the numerous cars on our roads are creating excess carbon emissions.*

For this project, we have partially filled in a problem statement for you, so your students will be brainstorming the **why** portion. Complete the problem statement and have students refer to it often during the remainder of the investigation phase:

Our community needs **a tree planting** because _____.

For additional discussion, you could have students answer the project's driving question in more depth. How you choose to have students answer this question is up to you—it could be in a reflection paper, group discussion, or presentation. The "answer" to the driving question should include reference to your action.
     Driving Question: *How can native trees help to mitigate environmental problems in my own community?*

Prepare

Your class has identified why your community needs a tree planting. Now you must determine your plan for action.

RESEARCH

Planting trees does much more good for the planet than simply mitigating carbon dioxide emissions. Trees can act as a riparian buffer, help prevent erosion, shade outdoor areas or buildings, provide habitat, and beautify your community.
As you begin to plan your tree planting, consider the following questions:
• What other problems can the trees solve?
    • Riparian buffer? Is there a nearby stream or river that could use some additional trees along its banks? You can help reinforce the stream bank, increase habitat and diversity, and filter and buffer water.
    • Shading? Can you place trees near your home, school, or office building in a way that would provide shade in the summer and buffer against winter winds? This may help to decrease your heating and cooling costs.
    • Erosion prevention? Are there hills in your community that could benefit from trees and their root structures to help prevent erosion?
• What types of trees are native to the area? Native trees will require less maintenance over time, as they are well adapted for your climate and soil type.

How to Host a Tree Planting

Students may turn to the Internet to begin their research, but we recommend contacting a local expert to conduct an in-class interview (either in person or via Skype or Google Hangouts). You might reach out to your local Department of Agriculture, Soil & Water Commission, local Conservation District, or even a master gardener. These experts should be able to answer students' questions about which types of trees will thrive in the area, locations in need of additional tree cover, and ways to locate affordable trees for planting.

The Arbor Day Foundation's website has many excellent resources to help you pick the right species of tree for your planting. We recommend exploring their "Tree Wizard," which takes into account location, soil type, and space available.

PLAN

Once you have determined the location and tree type for your planting, you will need to set a date and gather supplies. Working with a local expert or nursery is an ideal way to ensure that all necessary supplies are available and may be delivered on time. Are there organizations in your community that can offer trees as in-kind donations to the project? Are volunteers able to bring their own shovels or gloves? While planning, consider the following factors:

- If you are in a public space, what permits do you need? This could include permits for the physical planting of trees and/or holding an event.
- How many volunteers will you need for the planting? This will depend on how many trees you are trying to plant and how quickly you want to complete the work.
- Where will you obtain supplies ? These may include: trees, shovels, gardening gloves (optional), a water source to water newly planted trees, and scissors or box/wire cutters to remove trees from containers.
- Will you need to provide drinking water or food for your volunteers?
- Are there facilities available for restrooms, shade, or resting during the planting?
- Who will organize and check-in volunteers on the day of the event?
- Maintenance: How will tree upkeep be handled? Who will be responsible for watering and checking on the trees, especially during the first few months or years?

The Arbor Day Foundation has tips for planting different types of trees (bare root, containerized, or burlapped). Be certain to consult these before the day of your event.

How to Host a Tree Planting

Take Action

Enjoy your day! The planning is over, the materials are purchased and it is time for your install! Be sure to compliment yourself on your success and spread the word about your accomplishments!

Pause to Reflect Once the trees have been planted, take a moment to reflect on what you have done and how you have positively impacted the environment. Many of our daily actions release carbon into the atmosphere, and much of that carbon will find its way to our ocean. No matter how close or far you are from the ocean, all of our actions, positive or negative, have an impact. During reflection, brainstorm with your class all the ways their daily lives are touched by the ocean (food, recreation, etc.). How are the trees you have planted helping to preserve and improve all the ways we interact with the ocean?

Share

Share your story with the world! Get creative and share your story over some of your favorite mediums (social media, YouTube, blogs, school newspapers, etc.). There is no limit to how you choose to share! If you need a jump start, check out Telling Your Story: Message Guidelines. Be sure to share your story with EarthEcho by completing this simple reporting form.